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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,502	04/04/2005	Andrew Robert Harvey	04-850	4201

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EXAMINER
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NUR, ABDULLAHI

ART UNIT	PAPER NUMBER
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2877

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/511,502

Applicant(s)

HARVEY ET AL.

Examiner

Abdullahi Nur

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/1/2005
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 12-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hopkins (US Patent # 5,982,497).

As to claims 1 and 20, Hopkins teaches an imaging spectrometer comprising; an imager 12 for dividing a received image into two or more spatially separated spectral images (column 2 lines 49-53), and detector apparatus 36 (column 5 line 34) for detecting each spectral image, wherein the imager comprises at least one polarizing beam splitter (column 7 lines 44-54).

As to claim 2, Hopkins teaches all as applied to claim 1, and in addition teaches an image replicator 22 to produce two or more spatially separated images (column 4 lines 54-64) and one or more filter elements (column 4 lines 14-17) which act to alter the spectral characteristics of one or more of the spatially separated images.

As to claim 3, Hopkins teaches all as applied to claim 2, and in addition teaches dichroic filter 60 (Fig.9).

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As to claim 4, Hopkins teaches all as applied to claim 2, and in addition teaches filter elements located in the vicinity of said detector apparatus or a conjugate plane thereof (Fig.4).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hopkins in view of Greivenkamp, Jr. (US Patent # 4,575,193).

4. As to claim 5-7, Hopkins teaches all as claim 2, except for the variable optical retardation element. Greivenkamp, Jr. teaches variable optical retardation elements 18, 20 (wave plate) located between the beam splitters (Fig. 2a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate retardation elements as taught by Greivenkamp, Jr. into Hopkins's apparatus for the purpose of retarding one component of the light ray

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with respect to another component, thereby changing the polarization state of the light ray (column 5 lines 35-38); and varying the intensity of colors of light in the spots by rotating or changing the retardation element (column 8, line 1-3).

As to claim 8, Hopkins teaches all as applied to claim 2, and in addition teaches a spectrometer wherein the splitting of light is wavelength independent (column 6, lines 7-14).

As to claim 9, Hopkins in view of Greivenkamp, Jr. teaches all as applied to claim 1, except for the spectral replicator being arranged in optical series, each spectral replicator comprising an optical retardation element and a polarizing beam splitter. Greivenkamp, Jr teaches a spectral replicator that is arranged in optical series, each spectral replicator comprising an optical retardation element and a polarizing beam splitter (Fig.7a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the spectral replicator in series as taught by Greivenkamp, Jr to further refine the spectral resolution of the image.

As to claims 10 and 11, Hopkins in view of Greivenkamp, Jr. teaches all as applied to claim 9, except that one or more of the optical retardation elements provides a wavelength dependent polarization change; the thickness of the one or more optical retardation elements is chosen to define the spectral properties of each spectral image.

Greivenkamp, Jr teaches a wavelength means for changing the polarization state of the light such that the polarization state of light of a first color is changed by a first amount, and the polarization state of light of a second color is changed by a second

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amount different from the first (column 2, lines 31-36); and that the respective thickness and arrangement of the optical elements (birefringent and retarders) can reduce the aliasing (distortion) effects in the color image sensing system (column 2, lines 38-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate optical retardation elements as taught by Greivenkamp, Jr into Hopkins's apparatus in order to provide an optical spatial frequency filter having a color dependent spatial frequency response (column 2, lines 28-30).

As to claim 12, Hopkins teaches all as applied to claim 1, and in addition teaches four or more spatially separated spectral images are produced (column 6, lines 15-18).

As to claim 13, Hopkins teaches all as applied to claim 1, and in addition teaches optical filters adapted to transmit only selected waveband (column 5, lines 35-36).

As to claim 14, Hopkins teaches all as applied to claim 1, and in addition teaches detector apparatus comprising a detector array, each replicated image being directed to a separate portion of the detector array (column 5, lines 30-36).

As to claim 15, Hopkins teaches all as applied to claim 1, and in addition teaches two or more detector arrays 36 (Fig.3).

As to claim 16, Hopkins teaches all as applied to claim 15, and in addition teaches a spectrometer wherein a separate detector array is provided to detect each replicated image (Fig.3).

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As to claim 17, Hopkins teaches all as applied to claim 1, and in addition teaches a prism 26 that is capable of separating randomly polarized or unpolarized light into two orthogonal, linearly polarized outgoing beams.

As to claim 18, Hopkins teaches all as applied to claim 1, and in addition teaches a spectrometer wherein the optical components of the imager are formed as a single compound optical element 12 (an image collection subassembly).

As to claim 19, Hopkins teaches all as applied to claim 1, and in addition teaches a spectrometer comprising a field stop, the field stop which can limit the field of view of the image received by the imager (column 10, line 18).

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdullahi Nur whose telephone number is (571) 270-1298. The examiner can normally be reached on Monday - Friday, 8 a.m. to 5p.m. EST.

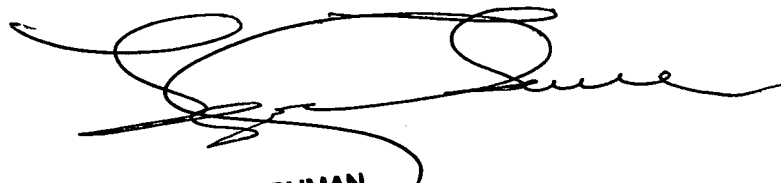
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abdullahi Nur  
Patent Examiner  
AU 2877

*AN*



LAYLA G. LAUCHMAN  
PRIMARY EXAMINER